

Appl. No. 10/670,634
Amdt. dated July 20, 2004
Reply to Official Notice of May 10, 2004

DOCKET NO. SC12856TP

REMARKS

This communication is in response to an Office Communication mailed May 10, 2004. In response thereto Applicants are herein amending claims 1, 2, 6, 8-10, 12, 14, 18, 21 and 22 and canceling claims 3-5, 16 and 17. Applicants request the reconsideration of and the allowance of claims 1, 2, 6-15 and 18-22.

Claims 1-4, 8, 9, 11-16 and 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu, U.S. Patent No. 5,856,226. Claims 3, 4 and 16 are herein canceled making the rejection moot with respect to these claims. Wu discloses a transistor having sidewall spacer structures that are made of silicon nitride (Col. 5, lines 51-54). At Col. 5, lines 49-54, there is disclosed that Wu removes the sidewall spacer structures using the etchants CCl_2F_2 , CHF_3 , CF_4 , CF_4/O_2 , CF_4/H_2 , CHF_3 , CH_3CHF_2 . All of the etchants that are used by Wu are compounds that contain fluorine. Independent claims 1, 14 and 21 as amended herein recite the use of a silicon germanium sidewall spacer and the use of atomic or molecular fluorine to remove the silicon germanium sidewall spacer. As taught in Applicants' specification at page 6, lines 15-16, "Transistor 32 is exposed to a F_2 (molecular fluorine) or an F (atomic fluorine) ambient." As taught at page 6, line 26 to page 7, line 3, "Atomic fluorine reacts preferentially with silicon germanium while it does not react with the silicon dioxide insulating layers achieving selectivity from anywhere in a range of substantially 50 to 1 up to over 1,000 to 1 depending upon pressure and temperature". It should be noted that most technical papers and patents that discuss the removal of a sidewall spacer illustrate a clean and ideal removal of the sidewall spacer. In reality, the use of etchants that are fluorine-containing compounds result in spacer material residue and damage to surrounding surfaces. In addition to the stringer residue problem discussed in Applicants' FIG. 2, the other elements in the fluorine-containing compound deposit onto the semiconductor structure and modify the electrical and physical properties of the structure. Such modifications are highly variable and degrade the device performance. Wu does not teach or recognize the use of atomic or molecular fluorine with silicon germanium sidewall spacers as recited in amended independent claims 1, 14 and 21. Applicants therefore request the reconsideration and the withdrawal of the rejection of remaining claims 1, 2, 8, 9, 11-15 and 20-

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22 are rejected under 35 U.S.C. 102(b).

Claims 5-7, 10 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. (U.S. Patent 5,320,974). Claims 5 and 17 are herein canceled to make the rejection moot with respect to those claims. Hori et al. teach a transistor that has silicon nitride spacers made from a silicon nitride film (see Col. 6, lines 50-51). Hori et al. also teach removing the silicon nitride spacers by a dry etch using an etching gas such as CH_2F_2 and NF_3 . As with the Wu patent above, Hori et al. teach an etchant that is a fluorine compound. Hori et al. does not teach or recognize the use of atomic or molecular fluorine with silicon germanium sidewall spacers as recited in amended independent claims 1 and 14 from which claims 6-7, 10, 18 and 19 depend. With respect to claim 10, Applicants' specification does amply contain critical results on page 7, lines 1-9 as to how the use of atomic fluorine or molecular fluorine selectively removes silicon germanium sidewall spacers. In the stated rejection, Applicants were referred to Wolf, V. I, pp. 546-51. On pages 547-551 Wolf describes the etching of silicon and silicon dioxide in fluorocarbon-containing plasmas. Again, the use of CF_4 as an etchant of silicon and SiO_2 does not teach or suggest the methods recited in claims 6-7, 10, 18 and 19. Wolf does not teach or recognize the use of atomic or molecular fluorine with silicon germanium sidewall spacers as recited in amended independent claims 1 and 14. Applicants therefore request the reconsideration of and the withdrawal of the rejection of pending claims 6, 7, 10, 18 and 19.

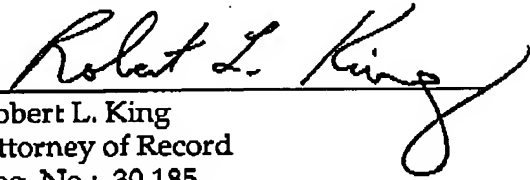
Applicants respectfully request consideration of the amendments and the allowance of claims 1, 2, 6-15 and 18-22, thereby placing the application in condition for allowance. Should issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned at (512) 996-6839.

Respectfully submitted,

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